

We claim:

- 1           1. A switch box for connecting a first telephone set and a second telephone set over a  
2           selected one of a primary network and a secondary network, the switch box comprising:  
3           primary network connecting means for connecting the first telephone set to the primary  
4           network;  
5           secondary network connecting means for connecting the first telephone set to the  
6           secondary network, for receiving address information from the secondary network to locate the  
7           second telephone set on the secondary network and for establishing a connection over the  
8           secondary network between the first telephone set and the second telephone set;  
9           relay means for (i) connecting, when the relay means is in a first state, the first telephone  
10          set to the primary network connecting means and for (ii) connecting, when the relay means is in a  
11          second state, the first telephone set to the secondary network connecting means; and  
12          switching means for receiving a switch-over command to switch from the primary  
13          network to the secondary network and for controlling, in response to the switch-over command,  
14          (i) the relay means to disconnect the first telephone set from the primary network connecting  
15          means and to connect the first telephone set to the secondary network connecting means and (ii)  
16          the secondary network connecting means to establish the connection over the secondary network  
17          between the first telephone set and the second telephone set.
- 1           2. A switch box as in claim 1, wherein the switching means comprises:  
2           a button on the switch box; and  
3           means for receiving the switch-over command through actuation of the button.
- 1           3. A switch box as in claim 1, wherein the switching means comprises means for  
2           monitoring the first telephone set to receive the switch-over command through the first telephone

3 set.

1 4. A switch box as in claim 1, wherein the primary network connecting means comprises  
2 means for providing a passive pass-through connection between the first telephone set and the  
3 primary network.

1 5. A switch box as in claim 4, wherein:  
2 the primary network is an analog circuit-switched telephone network;  
3 the secondary network is a digital packet-switched data network; and  
4 the secondary network connecting means comprises means for (i) connecting the first  
5 telephone set to the digital packet-switched data network, (ii) connecting the first telephone set to  
6 the second telephone set over the digital packet-switched data network and (iii) exchanging  
7 packets representing voice signals between the first telephone set and the second telephone set  
8 over the digital packet-switched data network.

1 6. A switch box as in claim 4, wherein the secondary network connecting means  
2 comprises:  
3 a microprocessor for controlling the connection over the secondary network between the  
4 first telephone set and the second telephone set;  
5 memory means for storing embedded software for execution by the microprocessor;  
6 modem means for permitting communication between the microprocessor and the  
7 secondary network; and  
8 signal processing means for converting between the voice signals and the packets.

1 7. A switch box as in claim 6, wherein the signal processing means comprises a vocoder.

1 8. A switch box as in claim 6, wherein the signal processing means comprises a digital  
2 signal processor.

1           9. A switch box as in claim 6, wherein the embedded software comprises software for the  
2   microprocessor to store identifying information in the memory means regarding the second  
3   telephone set, the identifying information being used to retrieve the address information.

1           10. A switch box as in claim 9, wherein the identifying information regarding the second  
2   telephone set comprises a telephone number identifying the second telephone set.

1           11. A system for communication over a selected one of a primary network and a  
2   secondary network, the system comprising a plurality of switch boxes, each for connection to a  
3   telephone set, each of the plurality of switch boxes comprising:

4           primary network connecting means for connecting the telephone set to the primary  
5   network;

6           secondary network connecting means for connecting the telephone set to the secondary  
7   network, for receiving address information from the secondary network to locate another  
8   telephone set connected to another switch box from among the plurality of switch boxes and for  
9   establishing a connection over the secondary network between the telephone set and said other  
10   telephone set;

11          relay means for (i) connecting, when the relay means is in a first state, the telephone set to  
12   the primary network connecting means and for (ii) connecting, when the relay means is in a  
13   second state, the telephone set to the secondary network connecting means; and

14          switching means for receiving a switch-over command to switch from the primary  
15   network to the secondary network and for controlling, in response to the switch-over command,  
16   (i) the relay means to disconnect the telephone set from the primary network connecting means  
17   and to connect the telephone set to the secondary network connecting means and (ii) the  
18   secondary network connecting means to establish the connection over the secondary network

19 between the telephone set and the other telephone set.

1 12. A system as in claim 11, wherein the switching means comprises:

2 a button on the switch box; and

3 means for receiving the switch-over command through actuation of the button.

1 13. A system as in claim 11, wherein the switching means comprises means for

2 monitoring the telephone set to receive the switch-over command through the telephone set.

1 14. A system as in claim 11, wherein the primary network connecting means comprises

2 means for providing a passive pass-through connection between the telephone set and the

3 primary network.

1 15. A system as in claim 14, wherein:

2 the primary network is an analog circuit-switched telephone network;

3 the secondary network is a digital packet-switched data network; and

4 the secondary network connecting means comprises means for (i) connecting the

5 telephone set to the digital packet-switched data network, (ii) connecting the telephone set to the

6 other telephone set over the digital packet-switched data network and (iii) exchanging packets

7 representing voice signals between the telephone set and the other telephone set over the digital

8 packet-switched data network.

1 16. A system as in claim 14, wherein the secondary network connecting means

2 comprises:

3 a microprocessor for controlling the connection over the secondary network between the

4 telephone set and the other telephone set;

5 memory means for storing embedded software for execution by the microprocessor;

6 modem means for permitting communication between the microprocessor and the

7 secondary network; and

8 signal processing means for converting between the voice signals and the packets.

1 17. A system as in claim 16, wherein the signal processing means comprises a vocoder.

1 18. A system as in claim 16, wherein the signal processing means comprises a digital  
2 signal processor.

1 19. A system as in claim 16, wherein the embedded software comprises software for the  
2 microprocessor to store identifying information in the memory means regarding the other  
3 telephone set, the identifying information being used to retrieve the address information.

1 20. A system as in claim 19, wherein the identifying information regarding the other  
2 telephone set comprises a telephone number identifying the other telephone set.

1 21. A system as in claim 14, further comprising server means, in communication with the  
2 digital packet-switched data network, for (i) receiving a connection request from a first one of the  
3 switch boxes which wants to establish a connection over the digital packet-switched data  
4 network to a second one of the switch boxes and (ii) sending to the first one of the switch boxes  
5 the address information regarding the second one of the switch boxes to allow the first one of the  
6 switch boxes to connect to the second one of the switch boxes.

1 22. A system as in claim 21, wherein the address information regarding the second one of  
2 the switch boxes comprises an IP address of the second one of the switch boxes.

1 23. A system as in claim 21, wherein the server means comprises means for (i) receiving  
2 connection requests from the first and second ones of the switch boxes, (ii) queuing a first  
3 received one of the connection requests in a queue and (iii) searching the queue in response to a  
4 second received one of the connection requests to match the connection requests.

1 24. A system as in claim 11, further comprising a help desk in communication with at

2 least one of the primary network and the secondary network, the help desk having at least one  
3 agent station, each of the at least one agent station comprising:

4 a telephone set, connected to said at least one of the primary network and the second  
5 network, for voice communication with the telephone set connected to any of the plurality of  
6 switch boxes; and

7 means for programming said any of the plurality of switch boxes over said at least one of  
8 the primary network and the secondary network.

1 25. A device for allowing a user with a telephone set to send and receive voice mail to  
2 and from an electronic mail server on a digital data network, the device comprising:

3 signal processing means, connected to the telephone set, for (i) converting an outgoing  
4 voice mail message spoken by the user into the telephone into an outgoing digital message and  
5 (ii) converting an incoming digital message into an incoming voice mail message and playing the  
6 incoming voice mail message over the telephone to the user;

7 communication means, connected to the signal processing means and the digital data  
8 network, for (i) sending the outgoing digital message to the electronic mail server for delivery to  
9 a recipient and (ii) retrieving the incoming digital message from the electronic mail server; and

10 control means, connected to the communication means, for receiving commands from the  
11 user and for controlling the communication means, in accordance with the commands, to supply  
12 the electronic mail server with information identifying the recipient so that the outgoing digital  
13 message is delivered to the recipient and to control retrieval and erasure of the incoming digital  
14 message from the electronic mail server.

1 26. A device as in claim 25, wherein the control means comprises means for monitoring  
2 the telephone set to receive the commands input by the user through the telephone set.

1           27. A device as in claim 25, wherein the information identifying the recipient comprises  
2 an electronic mail address for the recipient.

1           28. A device as in claim 25, wherein the control means is further connected to the signal  
2 processing means and comprises means for controlling playback of the incoming voice message  
3 in accordance with the commands.

1           29. A method for connecting a first telephone set and a second telephone set over a of a  
2 primary network and then a secondary network, the method comprising:

3           (a) establishing a first connection between the first telephone set and the second telephone  
4 set over the primary network;

5           (b) agreeing to switch to the second network and disconnecting both the first telephone  
6 set and the second telephone set from the primary network;

7           (c) connecting the first telephone set and the second telephone set to the secondary  
8 network;

9           (d) providing, over the secondary network, at least one of the first telephone set and the  
10 second telephone set with address information to connect the first telephone set with the  
11 telephone set over the secondary network; and

12           (e) connecting the first telephone set to the second telephone set via the secondary  
13 network.

1           30. A method as in claim 29, wherein step (b) comprises actuating a dedicated button on a  
2 device attached to each of the first telephone set and the second telephone set to disconnect the  
3 first telephone set and the second telephone set from the primary network.

1           31. A method as in claim 29, wherein step (b) comprises issuing a command through a  
2 keypad of each of the first telephone set and the second telephone set to disconnect the first

3 telephone set and the second telephone set form the primary network.

1 32. A method as in claim 29, wherein each of the first telephone set and the second  
2 telephone set is connected to the primary and secondary networks through a switch box which  
3 provides a passive pass-through connection to the primary network during step (a).

1 33. A method as in claim 32, wherein:  
2 the primary network is an analog circuit-switched telephone network;  
3 the secondary network is a digital packet-switched data network; and  
4 step (e) comprises (i) connecting the first telephone set to the second telephone set over  
5 the digital packet-switched data network and (ii) exchanging packets representing voice signals  
6 between the first telephone set and the second telephone set over the digital packet-switched data  
7 network.

1 34. A method as in claim 33, wherein the switch box connected to the first telephone set  
2 comprises a memory for storing identifying information regarding the second telephone set, the  
3 identifying information being used to retrieve the address information.

1 35. A method as in claim 34, wherein the identifying information regarding the second  
2 telephone set comprises a telephone number identifying the second telephone set.

1 36. A method as in claim 33, wherein step (d) comprises:  
2 (i) sending a connection request from a first one of the switch boxes to a server; and  
3 (ii) sending from the server to the first one of the switch boxes the address information  
4 regarding the second one of the switch boxes to allow the switch boxes to connect.

1 37. A method as in claim 36, wherein the address information regarding the second one of  
2 the switch boxes comprises an IP address of the second one of the switch boxes.

1 38. A method as in claim 36, wherein:



2 both switch boxes send connection requests to the server; and

3 step (d)(ii) comprises:

4 (A) queuing a first received one of the connection requests in a queue; and

5 (B) searching the queue in response to a second received one of the connection  
6 requests to match the connection requests.

1 39. A method for allowing a user with a telephone set to send and receive voice mail to  
2 and from an electronic mail server on a digital data network, the method comprising:

3 (a) converting an outgoing voice mail message spoken by the user into the telephone into  
4 an outgoing digital message;

5 (b) converting an incoming digital message into an incoming voice mail message and  
6 playing the incoming voice mail message over the telephone to the user;

7 (c) sending the outgoing digital message to the electronic mail server for delivery to a  
8 recipient;

9 (d) retrieving the incoming digital message from the electronic mail server; and

10 (e) receiving commands from the user and, in accordance with the commands, supplying  
11 the electronic mail server with information identifying the recipient so that the outgoing digital  
12 message is delivered to the recipient and controlling retrieval and erasure of the incoming digital  
13 message from the electronic mail server.

1 40. A method as in claim 39, wherein step (e) comprises monitoring the telephone set to  
2 receive the commands input by the user through the telephone set.

1 41. A method as in claim 39, wherein the information identifying the recipient comprises  
2 an electronic mail address for the recipient.

1 42. A method as in claim 39, further comprising controlling playback of the incoming

voice message in accordance with the commands.

43. A device for dynamically adjusting a communication between a computing device and a digital packet-switched network, the device comprising:

detecting means for monitoring at least a portion of the communication and for detecting a baud rate and a percentage of dropped packets in said at least a portion of the communication;

determining means for making a determination, in accordance with the baud rate and the percentage of dropped packets, as to whether a degree of compression, a packetization and a packet redundancy in the communication are acceptable for the baud rate; and

adjusting means for adjusting at least one of the degree of compression, the packetization and the packet redundancy in accordance with the determination.

44. A device as in claim 43, wherein the determining means comprises:

means for storing a look-up table; and

means for making the determination by applying the baud rate and the percentage of dropped packets to the look-up table.

45. A device as in claim 43, wherein:

the packet redundancy is adjustable to a first state or a second state;

in the first state, each packet in the communication is sent twice; and

in the second state, each packet in the communication is sent once.

46. A method for dynamically adjusting a communication between a computing device and a digital packet-switched network, the method comprising:

(a) monitoring at least a portion of the communication and detecting a baud rate and a percentage of dropped packets in said at least a portion of the communication;

(b) making a determination, in accordance with the baud rate and the percentage of

6 dropped packets, as to whether a degree of compression, a packetization and a packet redundancy  
7 in the communication are acceptable for the baud rate; and

8 (c) adjusting at least one of the degree of compression, the packetization and the packet  
9 redundancy in accordance with the determination.

1 47. A method as in claim 46, wherein step (b) comprises:

2 (i) storing a look-up table in a memory; and

3 (ii) making the determination by applying the baud rate and the percentage of dropped  
4 packets to the look-up table.

1 48. A method as in claim 46, wherein:

2 the packet redundancy is adjustable to a first state or a second state;

3 in the first state, each packet in the communication is sent twice; and

4 in the second state, each packet in the communication is sent once.

1 49. A server for allowing a first device and a second device to communicate over a  
2 packet-switched network, the server comprising:

3 means for receiving (i) a first communication request from the first device, the first  
4 communication request comprising first address information for locating the first device on the  
5 network, and (ii) a second communication request from the second device, the second  
6 communication request comprising second address information for locating the second device on  
7 the network; and

8 means for (i) maintaining a communication request queue, (ii) adding a first received one  
9 of the first and second communication requests to the queue, (iii) searching the queue in  
10 accordance with a second received one of the first and second communication requests to match  
11 the first and second received ones of the first and second communication requests (iv) if the

12 second received one of the first and second communication requests is the first communication  
13 request, providing the second address information to the first device, and (v) if the second  
14 received one of the first and second communication requests is the second communication  
15 request, providing the first address information to the second device.

1 50. A server as in claim 49, wherein each of the first and second address information  
2 comprises an IP address.

1 51. A method for allowing a first device and a second device to communicate over a  
2 packet-switched network, the method comprising:

3 (a) receiving a first communication request from the first device, the first communication  
4 request comprising first address information for locating the first device on the network;

5 (b) receiving a second communication request from the second device, the second  
6 communication request comprising second address information for locating the second device on  
7 the network;

8 (c) maintaining a communication request queue;

9 (d) adding a first received one of the first and second communication requests to the  
10 queue;

11 (e) searching the queue in accordance with a second received one of the first and second  
12 communication requests to match the first and second received ones of the first and second  
13 communication requests;

14 (f) the second received one of the first and second communication requests is the first  
15 communication request, providing the second address information to the first device; and

16 (g) if the second received one of the first and second communication requests is the  
17 second communication request, providing the first address information to the second device.

1           52. A method as in claim 51, wherein each of the first and second address information  
2   comprises an IP address.